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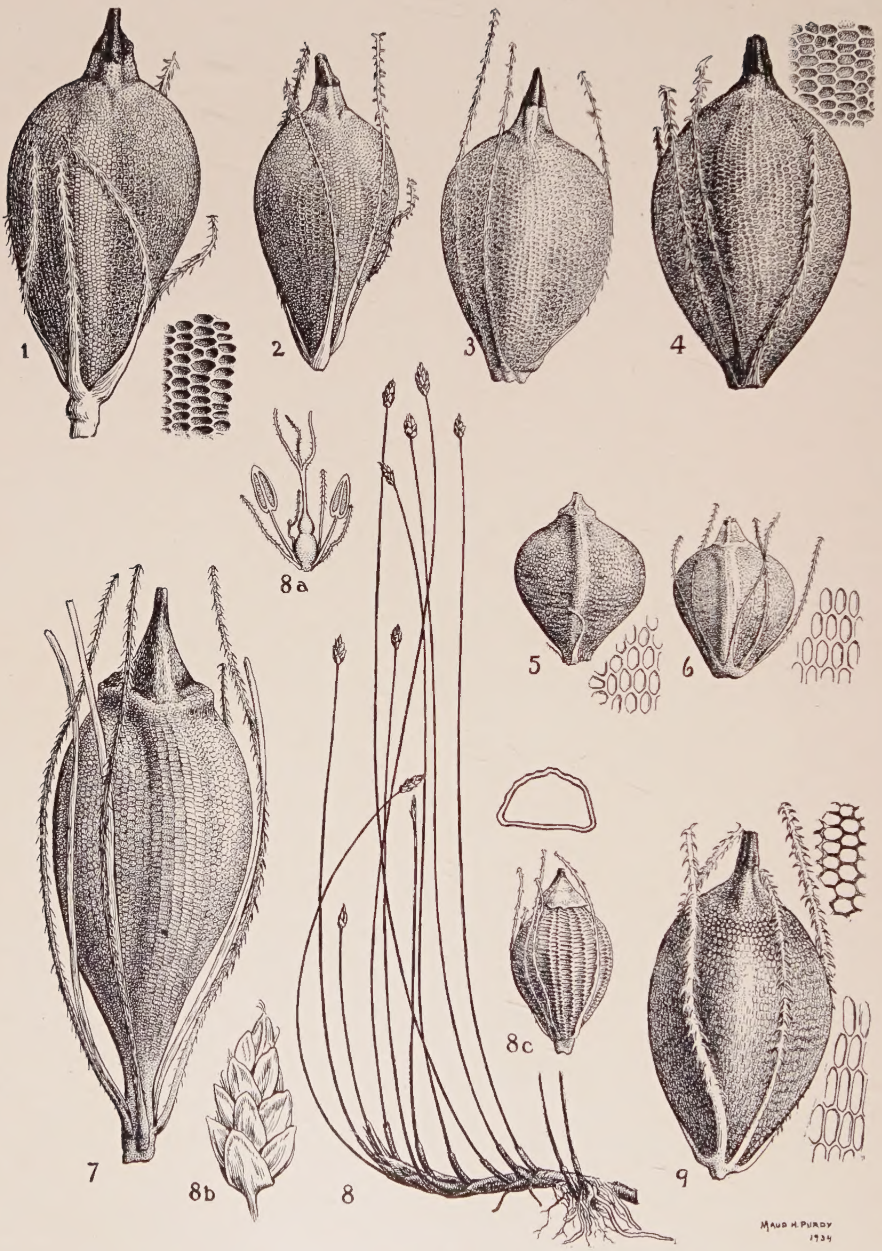

Eleocharis (achenes, × 20). E. pauciflora: fig. 1, from Scotland; fig. 2, from Maine (var. Fernaldii); fig. 3, from California (var. bernardina); fig. 4, from Chile.
E. parvula: fig. 6, from New York; fig. 5, from Louisiana (var. anachaeta).
E. margaritacea: fig. 7, from Kamtchatka.
E. squamigera: fig. 8, from Brasil (habit, × ½).
E. rostellata: fig. 9, from New York. The details of surface markings are placed at right of the achenes.

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JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 36. November, 1934. No. 431.

MONOGRAPHIC STUDIES IN ELEOCHARIS. III.[1]

H. K. Svenson

Plates 320 and 321

1. The Eastern American Segregate of Eleocharis pauciflora

Eleocharis pauciflora (Lightf.) Link from eastern America has a slender appearance compared with specimens from Europe. The fact was apparent to me in my previous treatment[2] of the species, but it seemed best to withhold further subdivision until material could be studied more closely. Shortly after a visit to the highlands of Scotland,[3] Professor Fernald wrote me describing the different appearance of *Eleocharis pauciflora* in its type region (Scotland) as compared with the plant from eastern United States to Newfoundland, calling my attention especially to differences in size of the spikelet and the size and shape of the achene. These differences I find in general are well sustained.

Even within identical geographic areas the achenes are greatly variable in mass, prominence of reticulation, degree of acuteness of the outer angle (plano-convex or even biconvex achenes will occasionally be encountered) and the clear-cut or obscure character of the tubercle. Being an attractive species, *E. pauciflora* is often collected in the flowering stage, and due also to the small number and variability of the achenes, tabulation of data is often both difficult and unsatisfactory. Material from the Himalayas and Andes is especially meagre. Whatever success I may have in portraying the variation of *E. pauciflora* and related species is due largely to the photographs made by Mr. Louis Buhle and the painstaking drawings by Miss Maud H. Purdy, both of the Brooklyn Botanic Garden. Professor Fernald has been kind enough to send me for comparison a large collection of *Eleocharis pauciflora* from the Gray Herbarium, and I have borrowed much additional material through the courtesy of the curators of herbaria of the United States National Museum, the New York Botanical Garden, the California Academy of Sciences, the University of Wisconsin, and the New York State Museum; and through the kindness of the curators of the Herbarium of the Royal Botanic Gardens at Kew I have examined the rich collection of *Eleocharis* and the unfinished manuscript left by the late C. B. Clarke. Mr. J. William Thompson of Washington has also sent me excellent material from his herbarium.

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[1] Brooklyn Botanic Garden Contributions, No. 68.

[2] Rhodora xxxi. 171 (1929).

[3] M. L. Fernald, Some Rare Plants of Scotland. Journ. Bot. lxix. 8–10. (1931).

As previously stated, one of the characteristic differences between the European and Eastern American plant is the size of achenes. Since it is difficult to accurately measure individual achenes to the tenth of a millimeter, a more satisfactory result is obtained by taking the total dimensions of four achenes placed end to end and side by side on a millimeter rule. Division of the total by four gives a good average size of individual achenes, as shown in the following table:

	EUROPE	
F. Schultz 1156	Germany	2.6 x 1.2 mm.
Fernald 2329	Scotland	2.5 x 1.3 mm.
Bordère	Hautes-Pyrénées	2.3 x 1.1 mm.
Rasmussen	Denmark	2.5 x 1.3 mm.
Kneucker 139	Switzerland	2.3 x 1.1 mm.
P. de la Bathie	France	2.6 x 1.2 mm.
	WESTERN NORTH AMERICA	
Patterson	Colorado	2.0 x 1.2 mm.
Mackenzie 186	Colorado	2.3 x 1.2 mm.
Nelson 6159	Wyoming	2.3 x 1.2 mm.
Rydberg 3811	Idaho	2.3 x 1.1 mm.
Macoun	Saskatchewan	2.0 x 1.1 mm.
Munz 10683	California	2.3 x 1.2 mm.
Peck 15438	Oregon	2.4 x 1.1 mm.
	SOUTH AMERICA	
Werdermann 1297	Chile	2.3 x 1.1 mm.
Johnston 4711	Chile	2.3 x 1.3 mm.
	EASTERN NORTH AMERICA	
Gray Exsic. 3	Maine	2.5 x 1.1 mm.
Fernald 12822	Maine	2.5 x 1.0 mm.

	EASTERN NORTH AMERICA—*Continued*	
Fernald 246	Maine[1]	1.9 x 0.9 mm.
Macoun 34565	Ontario	2.5 x 1.1 mm.
Deam 36640A	Indiana	2.5 x 1.1 mm.
Vasey	Illinois	2.4 x 1.0 mm.
	ASIA	
Griffith	Afghanistan	2.2 x 1.2 mm.
	VAR. SUKSDORFIANA	
Suksdorf 2237	Washington	2.8 x 1.4 mm.
Suksdorf 2820	Washington	2.8 x 1.1 mm.
A. S. Hitchcock	Arizona	2.6 x 1.3 mm.
	VAR. BERNARDINA	
Munz 10804	California	2.1 x 1.2 mm.
Hall 7608	California	2.0 x 1.1 mm.

Professor Fernald's collection (wet peaty slope at Kinlochewe, Rosshire, Scotland, *Fernald, Pease & Long* 2329) is robust, more so than any other European material which I have seen, with rigid culms 20–25 cm. high and spikelets 6–8 mm. long,[2] and with approximately six flowers in a spikelet (see PL. 321, FIG. 1). In conformity with practically all European specimens the hardened caudices contrast with the generally soft material from eastern America in which (at least in herbarium specimens) the weak rootstocks appear scarcely thicker than the culms. Notably in some specimens from western Newfoundland (*Fernald, Long & Fogg* no. 1338 from "peaty and marly borders of shallow ponds in limestone barrens, Pointe Riche" and *Fernald, Wiegand & Long* no. 27524 from the Straits of Belle Isle) and occasionally in other collections from the northern limit of the range the caudices are hardened, in this respect approaching the plants of Europe and western United States. I have seen *E. pauciflora* only as scattered individuals in wet concentrated marl, but according to Professor Fernald's observations, a sort of turf is often formed. This turf apparently does not become as dense as in *Scirpus cespitosus* with which *Scirpus pauciflorus* was confused in early times, a condition which is of some significance in the discussion of *Eleocharis Vierhapperi* to follow. Withering[3] at an early date observed that "The *S. pauciflorus* is very different in its habit from the *caespitosus*, for besides its growing single and not *cespitose*, the

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[1] Dwarf plants 6–9 cm. high.

[2] Hegi, Ill. Fl. Mittel-Eur. ii. 40 (1909), describes the spikelets of *E. pauciflora* as 4–8 mm. long, and 3–7 flowered.

[3] Arrangement of British Plants, ed. 6, ii. 112 (1818).

stems generally decline and scatter from each other, instead of being upright and close together."

The plant of Europe has in general a more prosperous appearance than the eastern American plant. The spikelets have a fuller aspect, and the achenes themselves are larger and more sharply angled. These characteristics together with the glistening surface and the strong regular development of bristle-teeth appear to be constant. The comparison may be summed up in tabular form:

E. PAUCIFLORA of Europe.	E. PAUCIFLORA of Eastern America.
Plants rigid, the caudices indurated.	Plants soft, with scarcely indurated caudices.
Spikelets 5–8 mm. long, averaging 6 flowers.	Spikelets a little narrower, 4–6 mm. long, averaging 5 flowers.
Achene equilaterally triangular, usually shiny.	Achene with abaxial angle usually somewhat broader, the achene usually dull and narrower than in the European plant.
Bristles with regular sharp retrorse teeth.	Teeth of bristles usually weak and irregular.

There is too much variation in surface markings and color of achenes for these characteristics to be of diagnostic value; the reticulation often varies greatly in different parts of the same achene, as may be seen in Miss Purdy's drawings. The surface is sometimes smooth, at other times with a depression in the central portion of each minute polygon. Longitudinal ribbing frequently occurs.

ELEOCHARIS PAUCIFLORA var. **Fernaldii**, n. var. PL. 320, FIG. 2; PL. 321, FIGS. 2, 5; also RHODORA xxxi. PL. 189, FIG. 23 (1929). A planta europaea recedit caudice non rigido, achaeniis angustioribus et minus angulatis, setarum barbis pusillis.—Western Ontario to Newfoundland, south to Iowa, Illinois, Indiana, northwestern Pennsylvania, central New York, and northern New England. The TYPE, *Fernald & Long* 12822 (in Gray Herb.) is from a marly bog, Monticello, Maine. Geographically interesting stations in addition to records in my previous paper are QUEBEC: Brushy Island, east coast of James Bay, *D. Potter* 791 (G); Mingan, *H. F. Lewis*, Canadian Field Nat. xlv. 201 (1931); Wolf Bay (50° 16′ N, 60° 18′ W) and Bradore Bay (51° 28′ N, 57° 14′ W) *H. F. Lewis* in 1927 (Albany); Oka, *Victorin* 738 (G). VERMONT: Lyndon, *Congdon* in 1873 (B). ONTARIO: Manitoulin Island, Lake Huron, *Fassett* in RHODORA xxxv. 388 (1933). INDIANA: Hammond, Lake County, *Deam* 53939 (B). MICHIGAN: Cheboygan County, *F. C. Gates* nos. 9417, 9465, 9818 (B). IOWA: Estherville, *B. O. Walden* in 1931 (G).[1]

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[1] To these records should be added: MAINE: Labrador Pond, East Sumner, *Gager & Svenson*, no. 6338. ONTARIO: Great Cloche Island, Manitoulin Distr., *Fernald & Pease*, no. 3146. MICHIGAN: Manistique, *Fernald & Pease*, no. 3147.

Dr. H. D. House of the New York State Museum at Albany has written me that *Eleocharis pauciflora* is not known in New York State east of Litchfield, Herkimer County, and that reports from the Adirondack region are probably based on specimens of *Scirpus cespitosus*.

The problem in western North America[1] is more difficult. The plants have thickened caudices and the achenes are closer in size (see table) and prominence of angles to those in Europe. The bristles, however, are more slender, resembling those of eastern American plants. Some of the western specimens are identical in appearance with the European, for example, *Nelson* 6159 from Yellowstone Park compared with *Petrak* 722, Fl. Bohemiae et Moraviae Exsic. I am inclined to believe that there is a series of intergrading variations between the gigantic var. *Suksdorfiana,* with its center of distribution apparently in the mountains of Washington and Oregon, to the depauperate material from southern California described as *Scirpus bernardinus*.[2] Of these two extremes the var. *Suksdorfiana,* at first confused with *Eleocharis rostellata,* is the more striking, with large spikelets often 1 cm. long and achenes approaching 3 mm. in length. Additions to collections of var. *Suksdorfiana* previously cited by me are WASHINGTON: near Egbert Spring, Douglas County, *Sandberg & Leiberg* 416 (B), culms reaching 35 cm. in height. OREGON: Mt. Hood, *Applegate* 2842 (U.S), with rigid culms 25–30 cm. high, similar to the type collection. COLORADO: Cassells, Park County, *Cathcart* in 1904 (U.S.), in flowering stage, culms broad, 30 cm. high, anthers 2–3 mm. long. ARIZONA: Flagstaff, *A. S. Hitchcock* in 1916 (U.S.). The last named collection has culms 5 dm. high and the largest subterranean buds measure approximately 1 x 0.5 cm. These buds or tubers appear to contain large quantities of starchy material, and in addition to being of value as food for aquatic birds (see RHODORA xxxi. 174 (1929), footnote), it is possible that selected stocks might produce a crop worth growing in boggy mountain meadows. The great economic value in the Orient of the "water chestnut" (*Eleocharis dulcis*) may be mentioned in this connection.

There is not yet sufficient understanding of *Eleocharis atacamensis* Philippi of the desert regions of Chile. This species Clarke reduced, with sufficient reason it seems to me, to the widespread and variable *Eleocharis pauciflora.* Barros[1] treats *E. atacamensis* as distinct, pointing out that in contrast to North American specimens of *E. pauciflora,* the 3–5 bristles are fewer, shorter than the achenes, thicker, and of a cinnamon color instead of white, and that the culms are arched. He also notes that the basal scale is sterile, whereas the plant of North America has the lowest scale fertile. Especially important is the heavy reticulation of the base of the style in undeveloped achenes (see fig. 31, l. c.) which Barros (and I am in perfect agreement with him) considers to be a distinctive characteristic of the genus *Eleocharis* as distinguished from *Scirpus.* This heavy reticulation is present to some extent in all species of the series *Pauciflorae* (cf. PL. 320), even in mature achenes. His figures of *Eleocharis atacamensis* leave no doubt in my mind that he is dealing with the same species that I have before me (represented by *Johnston* 4711 and *Werdermann* 1297). Philippi's description (quoted by Barros) calls for cespitose plants 3–3½ inches (8–9 cm.) tall and similar dwarf plants are figured by Barros. The abundant collection by Johnston contains dwarf spreading plants only 6 cm. high, (cf. PL. 320 FIG. 9) and tall erect ones reaching 25 cm., with many intermediates. Werdermann's plants (no. 1297) are 25–30 cm. tall; a representative of his no. 966 at Kew (Atacama, Chile 3600 m.) has a much thickened base and culms 22 cm. tall. In comparing these plants with specimens from North America and Europe, I am in agreement with Barros that the lowest scale is sterile (cf. *E. Vierhapperi*), a rare situation in *E. pauciflora.* The bristles are occasionally six. Their size does not differ appreciably from European material, but they do tend to be a trifle more reddish than in the general run of specimens. The style-base (tubercle) is generally less prominent and darker than in the North American and European specimens, but a whitened proximal area is sometimes well developed.[2] All things considered, this *Eleo-*

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[1] The northernmost material seen is from NORTHWEST TERRITORIES: shore of Keith Island, Great Slave Lake, *Raup* 374 (G).

[2] On the basis of material examined, I think *Scirpus bernardinus* should be considered merely as an aberrant form of *Eleocharis pauciflora.* Its status as a variety is questionable.

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[1] Anales Mus. Hist. Nat. Buenos Aires xxxiv. 486–488, fig. 31 (1928).

[2] The style-base (tubercle) of *E. pauciflora* (cf. PL. 320) is made up of two parts. The lower is an upright column frequently of more spongy texture than the body of the achene. It is also usually differentiated by three grooves which form roughly an equilateral triangle in a plane at right angles to the long axis of the achene. The upper part consists of a dark fragment of the style itself. In the Andean material of *E. pauciflora* the spongy lower part of the tubercle is often reduced, sometimes nearly obliterated, and tends in general to be darker than in European specimens. A collection recently received from Argentina: Prov. Jujuy, 2500 m. *Venturi* 9650 (U. S., B), shows no difference from typical *E. pauciflora* except a darkening of the spongy lower portion of the tubercle and slightly darker bristles.

The upper portion of the tubercle is probably homologous with the entire tubercle *charis* is so close to *E. pauciflora* that it may well be included within that species.

E. melanomphala C. B. Clarke, Engl. Bot. Jahrb. xxx. Beibl. 68: 24 (1901) was based upon a Chilean collection, *O. Kuntze* no. 30, Paso Cruz, 34° S, alt. 2100 m. The type specimen which I examined at Kew differs from *E. pauciflora* only in the plumper and smoother achene (2 mm. long), with its shorter tubercle. Reticulation characteristic of *E. pauciflora* is found on the achene, especially near the base.

The recently described *E. Vierhapperi* Bojko[1] from the South Tyrol Dolomites is said to differ from *E. pauciflora* in dwarfness (culms only 3–6 cm. high), in scattered (not cespitose) growth, in a thicker style which is not deciduous and which has 2 (occasionally 3) branches, in having 4 (or less) bristles, and the lowest scale of the spikelet *sterile* (in 27 out of 42 spikelets examined). The plants grew in strongly alkaline soil which had a concentration of 45% CaO and pH 7.8. Since lenticular achenes are occasionally found in *E. pauciflora*[2] it is therefore not surprising, though of great interest, to find a collection with transition from three to two style-branches. Persistence of the entire style in mature achenes of typical *E. pauciflora* is not uncommon. Both *E. pauciflora* and *E. Vierhapperi* are well illustrated and compared by Bojko, but I feel that *E. Vierhapperi* is a depauperate form of *E. pauciflora,* lying well within the limits of that species. The stolons as illustrated do not appear different from those of some other European collections, for example Flora Rhaetica Exsic. no. 414.

I have seen specimens of *E. pauciflora* from eastern Europe and Asia only as follows: GREECE: Pindus Tymphaeus, 4500–5000 ft., serpentine, *Haussknecht* in 1885 (Kew). AFGHANISTAN: *Griffith* (N. Y.). KASHMIR: Gurais Valley, *Winterbottom* 551 (Kew); Rangdum, 13000 ft., w. of Lara, Peti Valley, *Ormaston* 265 (Kew). TIBET OCC.: 15000–16000 ft., *Thomson* (Kew, G). The eastern, often indefinite, localities mentioned by Hultén (Fl. Kamt. i. 169 (1927)) I have represented by crosses in the accompanying map (MAP 1). He gives the range of *E. pauciflora* as Iceland, northern Scandinavia,

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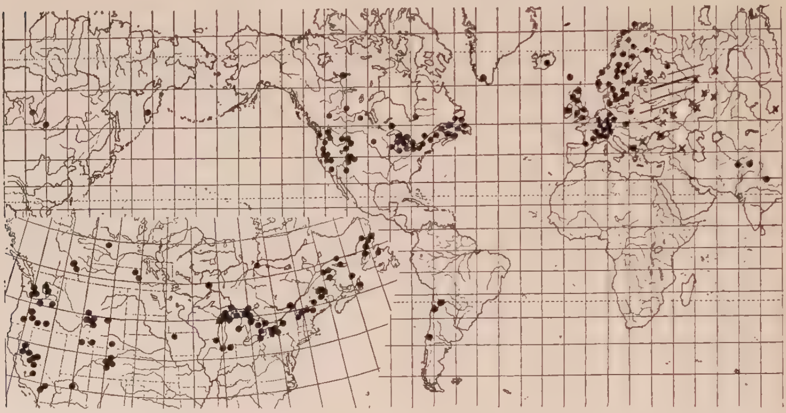
in such specialized types of *Eleocharis* as *E. palustris.* The situation in *E. pauciflora,* i. e. a spongy column tipped by a fragment of the style, is analogous to structures in several species of the *Mutatae,* notably *E. cellulosa, E. mutata* and *E. plicarhachis.*

[1] Verh. Zool.-Bot. Ges. Wien lxxix. 300, 10 figs. (1930).

[2] I have noticed them very sparingly in *Fl. Hungarica Exsic.* no. 177 (some of the styles appear bifid) and *Munz* no. 10804 (California).

Vologda and Urals (62° N. lat.) south to central France, Italy, Bulgaria, Crimea, Poltava and Kursk; also in Spain. Scattered localities occur in other parts of Russia and in Transcaucasia. ASIA: some few localities in Tomsk prov., Irkutsk prov., Transbaikalia, and Kamtchatka, also in N. E. Asia Minor [perhaps represented by *E. macrantha*], and (?) Kashmir, Pamir and Tibet. Fedtchenko (Rastitel nost Turkestana 161 (1915)) cites it from the Sungarian Altai, Tian Shan, and Pamir. The stations on the map from Scandinavia, Finland and Western Russia are largely compiled from Blomgren in Holmberg, Skand. Fl. 311 (1926). The plant is common in Norway north to Magerø (71° 7′ N) according to Blytt, Norges Fl. ed Dahl, 175 (1906).[1]



Map 1. Range of ELEOCHARIS PAUCIFLORA; insert, North American Range.

In a collection of *Eleocharis* from the U. S. National Herbarium, I was surprised to find good specimens of the closely related *E. rostellata* represented by *Venturi* nos. 6193 and 6194 from prov. Tucuman, Argentina, at altitudes of 2650 m. and 1650 m. respectively. These are the first records from South America. *E. platypus* C. B. Clarke, Engl. Bot. Jahrb. xxxiv, Beibl. 78. 3 (1904) is *E. rostellata*. The Spruce collection at Kew labeled "Andes Quitenses prope Guano

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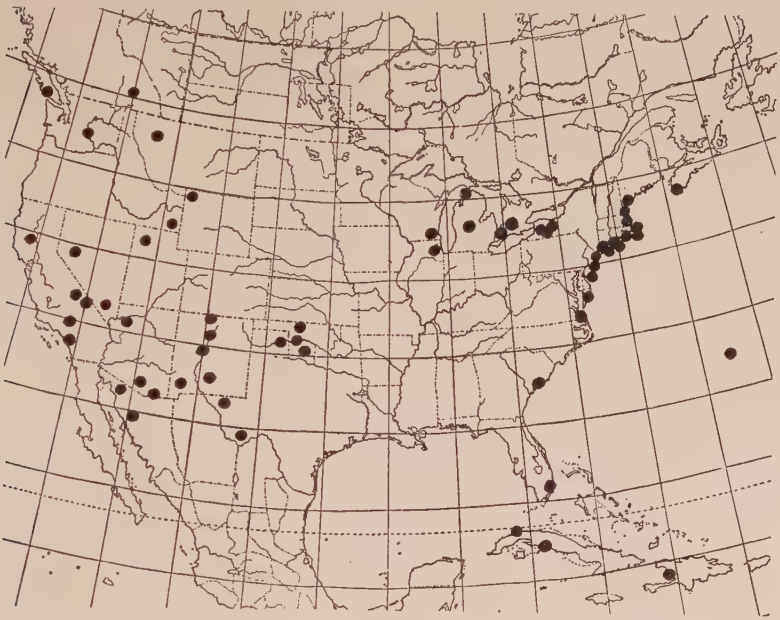
[1] In response to my inquiry as to the status of *E. pauciflora* in Greenland, Dr. Morten P. Porsild has written that, although the species is common in Iceland, it is one of the rarest plants in Greenland and is known at present from only four stations: Neria, 61° 33′, *J. Eugenius;* Igaliko, 61° 2′, *Rosenvinge;* Qagssiarssuk, 60° 53′, *A. E. & M. P. Porsild;* Unartoq, 60° 30′, *N. Hartz.*

1859" is the basis of Clarke's description. It consists of a plant with thickened rootstocks, long recurving culms, and achenes 2 mm. long, identical with those of *E. rostellata.* The presence of this species in the Andes further accentuates western South America as the center of distribution of the series *Pauciflorae.*[1] The accompanying map (MAP. 2) gives, with the exception of the South American specimens, the known distribution of *E. rostellata.*[2]



Map 2. North American Range of ELEOCHARSI ROSTELLATA.

In the illustrations of this group (PL. 320), I have selected material which shows the triangular and concave-sided character of the tubercle, which is probably the primitive condition. Immersion of these species (*E. rostellata, E. pauciflora,* and *E. parvula*) in an alkaline environment may possibly account for the indurated character of the tubercle which is so commonly seen.

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[1] *E. simulans* C. B. Clarke (see RHODORA xxxi. 181 (1929)) is according to Clarke's manuscript at Kew "only an extreme state of *E. melanostachys* d'Urville" which is *E. macrorhiza* Boeckl., a species of the *Palustres* described from the Falkland Is. This classification agrees with the 2-parted style shown in the figure of *E. simulans* Clarke, Ill. Cyp. t. xxxvi (1909).

[2] Plants from the station in northern Michigan representing undistributed material from Wycamp Lake, Emmett County, *H. A. Gleason,* July 29, 1933, have culms up to 14.5 dm. long.

Within the series *Pauciflorae* has appeared an additional, most unexpected species, which was published by Hultén as *Scirpus* (*Heleocharis*) *margaritaceus*. A specimen from the single known collection has been kindly given to me by Dr. Samuelsson. In order to conform with my treatment of *Eleocharis* I have written an emended description:

ELEOCHARIS **margaritacea** (Hultén), n. comb. PL. 320, FIG. 7. Subcespitose; culms glistening, 25–45 cm. high, sulcate, from a long gray caudex; apex of upper sheath blunt to slightly acute: spikelets about 1 cm. long, resembling those of *E. pauciflora*, the two lowest scales of the spikelet sterile, the lowest scale encircling the base of the spikelet, broadly ovate, deep brown below becoming yellowish-brown in older specimens, hyaline in the uppermost portion; the upper scales ovate, 1-nerved, obtuse or somewhat acute, costate, almost wholly scarious, with lacerate yellowish-brown margins in the older specimens: style 3-fid: stamens 3, with elongated flat whitened filaments: achene, including style-base, about 4 mm. long, glistening white with a cellular structure as in *E. pauciflora* but less prominent, the base much elongated, the apex surrounded by a turgid ring; style-base dark brown, conic-acute, approximately ½ to ⅔ mm. long, bristles brown, usually 6, retrorsely toothed, exceeding the achene.—*Scirpus* (*Eleocharis*) *margaritaceus* Hultén, Fl. Kamtchatka i. 167 fig. 12 (1927).[1] Known only from the type locality, between Petropavlovsk and Avatcha volcano, 250 m. alt. *Hultén* no. 1083. TYPE in Mus. Nat. Hist., Stockholm.

The shining white achenes, as Hultén notes, make the plant easily recognizable. Its relationship is unquestionably with *E. pauciflora* and the formation of a tumid ring at the base of the tubercle is curiously enough paralleled by a similar development in *E. albibracteata* and *E. boliviana* of the Andes. A character which is not shown by any other known species of *Eleocharis* is the long basal portion of the achene. This extended axis provides an unusual opportunity for examining the points of attachment of stamens and bristles. Careful dissection showed three stamens occupying the angles of the achene, inserted alternately with, and at the same level as three of the bristles. An additional set of three bristles occurred on a level of 0.4 mm. below, occupying positions corresponding to the achene angles, consequently directly opposite the stamens.

ELEOCHARIS PARVULA (R. & S.) Link var. **anachaeta** (Torr.)

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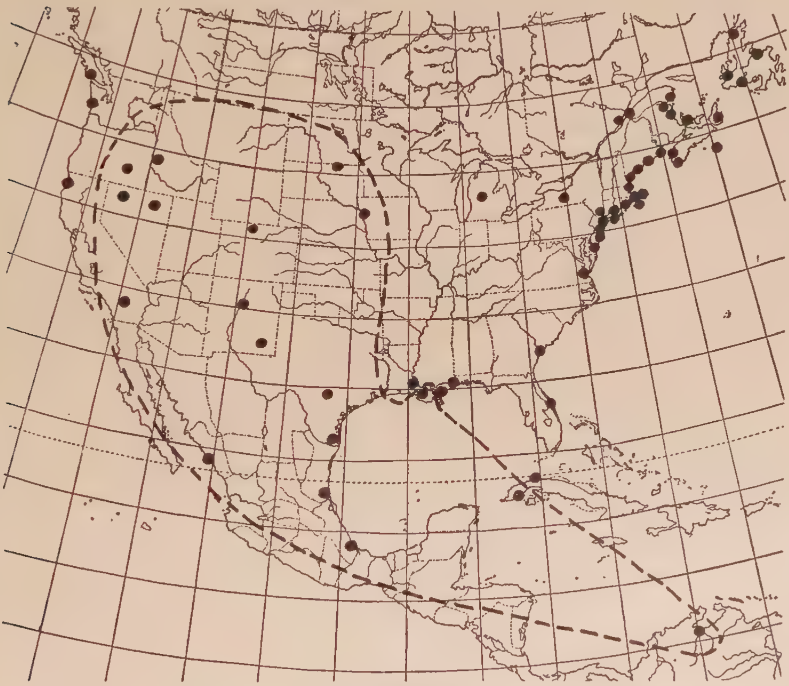
[1] Kungl. Sv. Vet. Akad. Handlinger. ser. 3, Bd. 5, no. 1.

n. comb.—*E. pygmaea* Torr. var. β? *anachaeta* Torr. Ann. Lyc. N. Y. iii. 441 (1836). *Chaetocyperus* (*Elaeocharis*) *membranaceus* Buckley, Proc. Acad. Sci. Philadelphia 1862 10 (1862). ?*Isolepis leptos* Steud. Cyp. 91 (1855). *Scirpus nanus* var. *anachaetus* Britton, Trans. N. Y. Acad. Sci. xi. 75 (1892). *Scirpus coloradoensis* Britton, Torreya iv. 93 (1904). *Eleocharis leptos* Svenson, including vars. *coloradoensis* and *Johnstonii*, Rhodora xxxi. 176 (1929); not *E. lepta* C. B. Clarke in Dyer, Fl. Capensis vii. 758 (1900).

In my previous treatment I considered the slightly verrucose to papillose character of the achene surface, exhibited in its extreme form in the plants described by Britton as *Scirpus coloradoensis*, as a sufficient character in conjunction with reduction of bristles to separate the plant of southwestern United States from the common salt-marsh plant of the northern states. Examination of a larger amount of material than was available at that time has led me to



Map 3. North American Range of Eleocharis parvula; var. anachaeta in ellipse.

ally the plants more closely, and in treating the southern plant as a variety I am following the opinions of both Torrey and Kükenthal. Sharply angled achenes are not uncommon. The specimen of *Chaetocyperus membranaceus* at the Philadelphia Academy of Sciences is now without achenes, but because of the tubers and striated scales it appeared on examination to be *E. parvula.* Asa Gray[1] has cited the same collection as "*Eleocharis pygmaea,* Torr., the variety with naked achenia noticed in Nicollet's report." Careful measurements of achenes of the type collection of *Scirpus coloradoensis* show an average length (according to the method employed with *E. pauciflora*) of 1.1 mm., in this respect not substantially differing from *E. parvula.* The best-developed collection of *E. parvula* var. *anachaeta* that I have studied is *Runyon* no. 182, which has green culms 10–12 cm. long and green spikelets 6 mm. long, with as many as 23 flowers in a spikelet. The achenes average exactly 1 mm. To the localities cited previously may be added: South Dakota: borders of ponds near James River, *Nicollet Exp.* (N. Y.).[2] Iowa: moist clay flats along shore of Brown's Lake, T. 87 N., R. 47 W., Woodbury Co., Sept. 28, 1933, *Hotchkiss* no. 4578 (B). Louisiana: salt marshes, New Orleans, *Hale* no. 56 (N. Y.). Texas: *C. Wright* in 1845 (N. Y.); Brownsville, *Runyon* no. 182 (U. S.); San Antonio, *Clemens* in 1911 (Cal.). Nevada: *A. G. Kennedy,* alkali ground, Elko, no. 4502. New Mexico: in marsh near Loving, *Standley* no. 40354 (U. S.); "moist places near Albuquerque" (Torrey, Pacific R. R. Rept. iv. 152 (1857)), presumably the collection (N. Y.) from "near 35th parallel, Fort Smith to the Rio Grande, *J. M. Bigelow.*" Mexico: Vera Cruz, Morro de Boquilla, *Liebmann* (Kew, mixed with *E. retroflexa*). This collection is included under *Chaetocyperus polymorphus* β. *capillaceus* by Liebmann, Mex. Halvgraes 242 (1851). Cuba: Pinar del Rio, *Ekman* no. 16567 (det. *Kukenthal*), a collection which has practically smooth achenes.

The Californian plant (*E. leptos* var. *Johnstonii*) differs only in its larger achenes and recurved culms. Further collections will show whether these characteristics are constant. Steudel's improperly constructed specific name is untenable because of Clarke's *Eleocharis lepta* from South Africa. Dr. N. C. Fassett has sent me sterile material from Devil's Lake, Sauk Co., Wisconsin, which judging from the tuberbearing rootstocks is apparently *E. parvula.* This is true also of the sterile specimens with remarkably fleshy culms from Quebec and New Brunswick, which I believed to be *Sagittaria graminea.*[1] Typical *E. parvula,* in addition to its common occurrence on the seashore of eastern United States, is widespread in Europe on borders of the Baltic, North and Mediterranean Seas.

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[1] Proc. Acad. Sci. Philadelphia 1862 167 (1862).

[2] This locality was incorrectly reported in my previous paper. Following the route of the *Nicollet Expedition* (1839) as given by G. W. Warren in Pacific R. R. Rept. xi. 40–42 (1859) and outlined on a map accompanying the report, the station appears to be in what is now Faulk County.

2. A NEW ELEOCHARIS FROM BRAZIL

ELEOCHARIS **squamigera**, n. sp. (PL. 320, FIG. 8) rhizomata elongata, cum squamis rubris instructa; culmis tenuibus sulcatis 5–20 cm. longis erectis vel recurvatis; vaginae apice acuto non mucronato; spicula ovata acutiuscula, 3–5 cm. longa, viridi vel castanea; gluma infima sterili, obtusa, hyalina; glumis ceteris acutiusculis carina viridibus cum lateribus roseis et margine hyalino; staminibus 2, antheris 0.8 mm. longis; stylo 3-fido; achaeniis quasi inter *E. acicularem* et *E. fistulosam,* trigonis vel plano-convexis, luteo-brunneis 1 mm. longis, longitudinaliter striatis et inter costas horizontaliter trabeculatis; stylobasi late conico-triangulato, acuto, brunnescenti; setis 6 luteo-brunneis tenuissimis, stylobasi aequilongis.—BRAZIL: Parana, Jaguariahyna in palud. *Dusén* 13276 (TYPE in Gray Herb.).

This specimen has the appearance of *E. tenuis* [*E. capitata* var. *typica*] and was so named by Pfeiffer. The systematic position is uncertain. In some respects the plant resembles the *Aciculares,* but the lowest scale of the spikelet is sterile. The surface markings have a similarity on a small scale to those of *E. fistulosa.*

EXPLANATION OF PLATE 320

(Habit-drawing ½ ×; achenes 20 ×)

FIG. 1, ELEOCHARIS PAUCIFLORA, Scotland, *Fernald, Pease & Long* 2329; 2, E. PAUCIFLORA var. FERNALDII, Maine, *Fernald & Long* 12822; 3, E. PAUCIFLORA var. BERNARDINA, California, *Hall* 7605; 4, E. PAUCIFLORA (*E. atacamensis*), Chile, *Werdermann* 1297; 5, E. PARVULA var. ANACHAETA, Louisiana, *Drummond* 409; 6, E. PARVULA, New York, *Svenson* 4712; 7, E. MARGARITACEA, Kamtchatka, *Hultén* 1083; 8, E. SQUAMIGERA, Brazil, *Dusén* 13276; 9, E. ROSTELLATA, New York, *Svenson* 4887.

EXPLANATION OF PLATE 321

ELEOCHARIS PAUCIFLORA, habit, a little less than ½ ×, achenes 10 ×. FIGS. 1 and 3, Scotland, *Fernald, Pease & Long* 2329; 2 and 5, Maine, *Fernald & Long* 12822 (var. FERNALDII); 4, Switzerland, *Fl. Rhaetica* 414; 6, Tibet, *Hooker;* 7 and 9, Chile, *Johnston* 4711; 8, California, *Hall* 7605 (var. BERNARDINA); 10, Chile, *Werdermann* 1297 (*E. atacamensis*); 11, Washington, *Suksdorf* 2237 (var. SUKSDORFIANA). Photo. by L. Buhle.

PLANTAGO ALTISSIMA IN MASSACHUSETTS.—Sometime ago I was checking various items in RHODORA against my own herbarium, and came across Professor Fernald's note on this species from the "Connecticut Coast" by H. S. Clark (RHODORA **24**: 204). I was consequently pleased to find in my own collection a very fine specimen of *P. altissima* L. from Nantucket, originally in the herbarium of Fred G. Floyd, which I bought in 1921. The specifications are "Edge of cultivated field, abundant; near Hummock Pond; June 7, 1906; *F. G. Floyd*, no. 2334." I took the sheet to the Gray Herbarium and made careful comparison with the European sheets and modern European floras. There is no better or more robust specimen in the Gray Herbarium than this one from Nantucket. Unfortunately a search through Mr. Floyd's unmounted duplicates fails to reveal another.—LUDLOW GRISCOM, Museum of Comparative Zoology, Harvard University.

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[1] See RHODORA xxxi. 169 (1929).

VALIDITY OF THE NAME LESPEDEZA[1]

B. P. G. HOCHREUTINER

I have read with great interest the article of P. L. Ricker concerning the Leguminose genus *Lespedeza*. I take now the liberty of expressing an opinion because I have been appointed by the International Nomenclature Commission to make the French version of the Rules which Dr. Briquet, former Rapporteur général, unfortunately could not elaborate.

That is why I want to say that I fully agree with Mr. Ricker when he "hopes that no overenthusiastic botanist will seize this case as an opportunity to make a new name or corrections sufficiently different in appearance to think he is entitled to place his name after all of the new combinations thus involved."

Unhappily, the Art. 70 of the new Rules is as follows: "the original spelling of a name must be retained except in the case of a typographic error or a clearly unintentional orthographic error."

Therefore, if things stand as Ricker states, any botanist is entitled: 1) to correct *Lespedeza* to begin with *Ces*; 2) to change *Cespedesia* (Ochnaceae) to some other name because it would be so similar to the altered *Lespedeza* that it creates confusion (Art. 70, paragraph 3) as the editors of *Rhodora* correctly remark in the last foot note. These changes in the generic names would involve of course changes in specific combinations.

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[1] Apropos an article of P. L. Ricker, RHODORA, xxxvi, 130–132 (1934).

Therefore, I consider that the publication of Ricker is particularly unfortunate, as it will call the attention of the "over-enthusiastic botanists" to a fact which they would have always ignored.

Now, I believe I am keeping the spirit of Briquet if I study the case, in order to prevent as far as possible changes in nomenclature. To stop such superfluous changes, there would be, of course, one method: a proposition to the Nomenclature Commission and a decision of a congress to add *Lespedeza* to the list of the *nomina utique conservanda* (Art. 21, note 1).

However, until the decision is taken, the "*over-enthusiastics*" will have published perhaps the new combinations and it may be useful to prevent it. That is why I venture to propose the following explanation, which is in perfect legal accordance with the Rules.

I note first the *Recommandation XXX* of the Vienna Rules: "The liberty of making orthographic corrections must be used with reserve, especially if the change affects the first syllable and above all the first letter of a name." That was the *article* 66 of the Paris laws, and it is very much to be regretted that so wise an advice was left out (although not contradicted) in the last edition of Cambridge.

But that is common sense and even if common sense is not enforced by law it still retains its authority.

Secondly, I must remind the reader that Ricker showed that the governor of Florida, in honour of whom the genus *Lespedeza* was named, bears a name which is written differently in various documents: V. M. de Céspedes or V. M. de Zespedes (*cf.* footnote of Ricker, p. 131).

Further, we must remark that in pure Spanish, C and Z, followed by an *e* are pronounced like the English *th,* a sound which it is impossible to transcribe in Latin.

Therefore, it is impossible to assume with absolute certainty that Michaux or the publishers, Richard or Michaux's son, did not *deliberately* alter the name and write it with an L, in order to meet French euphony.[1] Of course, one may *suppose* that it is due to an error of a copyist, but I wish to emphasize the fact that the slightest doubt prevents a correction, even on the ground of the new Cambridge Rules, in which the somewhat unusual expression, "only *unintentional orthographic errors* may be corrected" is used.

[1] The proof that elder naturalists changed often and deliberately letters in names on account of euphony or of special pronounciations can be found in the very same instance because Michaux wrote *Lespedeza* with a *z* in the second part of the word as *Cespedes* or *Zespedes* is always written with an s at the end. No doubt Michaux did so deliberately because he wanted to express in latin the very strong pronunciation by the Spaniards of the letter s.

Dr. Rendle, one of the most distinguished members of the International Nomenclature Commission, interprets that in saying that there *may be intentional orthographic errors*, i. e. orthographical changes deliberately adopted by the author, and these cannot be modified.

Now, if there is a case in which a so-called intentional error may be considered, it is this one, because the author of the name *Lespedeza* could not possibly guess how it should be written. It is so much the more obvious that if an "over-enthusiastic" botanist would correct it to-day, it would be quite impossible, because he would not know how. If he corrects it to begin with *Ces*, he will be unable to prevent another from correcting it to begin with *Zes*, *Thes*, or even *Fes* to satisfy the Portuguese pronounciation. We would have thus five valid names for the same thing, a very queer consequence of "overenthusiasm" in botany.

We conclude, therefore, that nobody is entitled to alter the name *Lespedeza* and, consequently, the well-known Ochnaceous name *Cespedesia* remains also perfectly valid.

Botanical Garden and Museum,
Geneva.

DRABA IN TEMPERATE NORTHEASTERN AMERICA

M. L. Fernald

(Concluded from page 371)

LIST OF EXSICCATAE CITED

Abbe, E. C.

371 glabella Pursh
372 nivalis Liljebl.
374 crassifolia Graham
375 fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
376 fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
377 nivalis Liljebl.
378 nivalis Liljebl.
379 fladnizensis Wulfen, var., heterotricha (Lindbl.) Ball
380 fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
381 fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
383 nivalis Liljebl.
384 fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
385 rupestris R. Br.
386 fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
387 fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
1261 glabella Pursh, var. megasperma (Fernald & Knowlt.) Fernald
1262 norvegica Gunner

Abee & Brooks

364 glabella Pursh
365 glabella Pursh
366 norvegica Gunner
367 glabella Pursh
368 norvegica Gunner

Abbe & Hogg

369 nivalis Liljebl.

Abbe, Hogg & Forbes

370 incana L., var. confusa (Ehrh.) Liljebl.

Abbe & Odell

373 fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
382 fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball

Abbe & Pease

363 norvegica Gunner

Allen, J. A.

25 glabella Pursh
76 incana L., var. confusa (Ehrh.) Liljebl.

Bell, Robert

2027 rupestris R. Br.

Bishop, Harlow

324 nivalis Liljebl.
325 glabella Pursh
326 glabella Pursh
327 incana L.

Blake, S. F.

5590 incana L., var. confusa (Ehrh.) Liljebl.

Bowdoin College Expedition, 1891.

269 incana L.

Butters & Buell

367 arabisans Michx.

Butters & Holway

40 aurea M. Vahl

Campbell, Robert

66,722 glabella Pursh

Collins & Fernald

88 incana L.
89 incana L., var. confusa (Ehrh.) Liljebl.
90 lanceolata Royle
91 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
94 pycnosperma Fern. & Knowlt.

Cooper, W. S.

40 arabisans Michx. and arabisans, var. canadensis (Brunet) Fern. & Knowlt.
112 incana L.

Delabarre, E. B.

93 aurea M. Vahl

Dodge, Griscom & Pease

25,773 clivicola Fernald

Dodge & Pease

25,787 nivalis Liljebl.
26,130 clivicola Fernald

Eames, A. J.

12,081 arabisans Michx.

Eggleston, W. W.

132 arabisans Michx.

Ehlers, J. H.

1103 arabisans Michx.
1352 arabisans Michx.

Erdmann

63 aurea M. Vahl

Erlanson, C. & E.

648 arabisans Michx.

Fassett, N. C.

15,566 lanceolata Royle

Fernald, Bartram, Long & St. John

7503 incana L., var. confusa (Ehrh.) Liljebl.
7504 incana L., var. confusa (Ehrh.) Liljebl.

Fernald & Collins

92 arabisans Michx.
93 arabisans Michx.
226 Allenii Fernald
577 minganensis (Victorin) Fernald
578 minganensis (Victorin) Fernald
579 minganensis (Victorin) Fernald
580 glabella Pursh, var megasperma (Fern. & Knowlt.) Fernald
581 Allenii Fernald
582 glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
583 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
1064 minganensis (Victorin) Fernald
1065 minganensis (Victorin) Fernald
1066 arabisans Michx.
1067 arabisans Michx.

1068 arabisans Michx.
1069 arabisans Michx.
1070 arabisans Michx.
1071 pycnosperma Fernald & Knowlton
1072 pycnosperma Fernald & Knowlton
1073 pycnosperma Fernald & Knowlton
1074 pycnosperma Fernald & Knowlton
1076 glabella Pursh
1076a glabella Pursh
1077 lanceolata Royle
1078 lanceolata Royle
1079 lanceolata Royle
1080 incana L., var. confusa (Ehrh.) Lilejbl.
1081 incana L., var. confusa (Ehrh.) Lilejbl.
1082 incana L.
1212 glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald

Fernald, Dodge & Smith

25,772 arabisans Michx.

Fernald, Griscom & Gilbert

28,355 laurentiana Fernald
28,372 norvegica Gunner

Fernald, Griscom & Mackenzie

25,781 Allenii Fernald
25,786 nivalis Liljebl.

Fernald, Griscom, Mackenzie, Pease & Smith

25,779 Allenii Fernald
25,782 Allenii Fernald
25,785 nivalis Liljebl.

Fernald, Griscom, Pease & Smith

25,783 Allenii Fernald
25,789 clivicola Fernald

Fernald & Gilbert

28,365 glabella Pursh

Fernald & Long

28,343 nivalis Liljebl.
28,344 nivalis Liljebl.
28,345 nivalis Liljebl.
28,346 nivalis Liljebl.
28,349 incana L., var. confusa (Ehrh.) Liljebl.
28,358 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
28,366 arabisans Michx.
28,367 arabisans Michx.
28,369 pycnosperma Fern. & Knowlt.
28,370 glabella Pursh
28,371 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
28,391 norvegica Gunner
28,396 norvegica Gunner
28,397 norvegica Gunner, var. hebecarpa (Lindbl.) O. E. Schulz
28,398 norvegica Gunner, var. hebecarpa (Lindbl.) O. E. Schulz
28,399 norvegica Gunner, var. pleiophylla Fernald
28,400 norvegica Gunner and var. pleiophylla Fernald
28,401 norvegica Gunner
28,402 norvegica Gunner
28,403 glabella Pursh
28,407 norvegica Gunner, var. pleiophylla Fernald
28,408 norvegica Gunner
28,408a norvegica Gunner, var. pleiophylla Fernald
28,409 norvegica Gunner
28,410 norvegica Gunner

Fernald, Long & Dunbar

26,703 norvegica Gunner
26,704 norvegica Gunner
26,705 norvegica Gunner, var. pleiophylla Fernald
26,706 incana L., var. confusa (Ehrh.) Lijebl.
26,707 incana L., var. confusa (Ehrh.) Lijebl.
26,708 incana L., var. confusa (Ehrh.) Lijebl.
26,709 incana L., var. confusa (Ehrh.) Lijebl.
26,710 norvegica Gunner
26,711 norvegica Gunner
26,712 norvegica Gunner and var. hebecarpa (Lindbl.) O. E. Schulz
26,713 laurentiana Fernald
26,714 laurentiana Fernald
26,715 incana L., var. confusa (Ehrh.) Liljebl.

Fernald, Long & Fogg

281 norvegica Gunner
1729 incana L., var. confusa (Ehrh.) Liljebl.

1730	incana L., var. confusa (Ehrh.) Liljebl.
1731	laurentiana Fernald
1732	arabisans Michx.
1733	arabisans Michx.
1735	arabisans Michx.
1736	arabisans Michx.
1737	glabella Pursh
1738	arabisans Michx.
1739	arabisans Michx.
1740	arabisans Michx.
1741	norvegica Gunner
1742	norvegica Gunner, var. hebecarpa (Lindbl.) O. E. Schulz
1743	norvegica Gunner
1744	norvegica Gunner, var. hebecarpa (Lindbl.) O. E. Schulz
1745	norvegica Gunner
1746	norvegica Gunner, var pleiophylla Fernald
1747	norvegica Gunner, var. pleiophylla Fernald
1748	norvegica Gunner, var. pleiophylla Fernald
1748½	glabella Pursh
1749	arabisans Michx., var canadensis (Brunet) Fern. & Knowlt.
1750	norvegica Gunner, var. pleiophylla Fernald
1751	glabella Pursh
1752	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald

Fernald, Long & Gilbert

28,352	incana L., var. confusa (Ehrh.) Liljebl.

Fernald, Long & St. John

7505	incana L., var. confusa (Ehrh.) Liljebl.

Fernald & Pease

3316	arabisans Michx.
3317	arabisans Michx., var canadensis (Brunet) Fern. & Knowlt.
3318	lanceolata Royle
25,089	incana L.
25,090	arabisans Michx.
25,091	arabisans Michx.
25,092	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
25,093	glabella Pursh
25,094	glabella Pursh and var. orthocarpa (Fern. & Knowlt.) Fern.
25,095	glabella Pursh
25,096	clivicola Fernald
25,097	Allenii Fernald
25,099	nivalis Liljebl.
25,100	nivalis Liljebl.

Fernald & Smith

25,777	clivicola Fernald
25,778	clivicola Fernald
25,780	Allenii Fernald
25,784	Allenii Fernald
25,788	nivalis Liljebl.

Fernald & Weatherby

2447	glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
2448	glabella Pursh

Fernald, Weatherby & Stebbins

2446	lanceolata Royle

Fernald & Wiegand

3453	incana L., var. confusa (Ehrh.) Liljebl.
3456	glabella Pursh, var. megosperma (Fern. & Knowlt.) Fernald
3458	glabella Pursh, var. megosperma (Fern. & Knowlt.) Fernald
3460	norvegica Gunner, var. pleiophylla Fernald
3461	norvegica Gunner, var. pleiophylla Fernald
3462	norvegica Gunner, var. pleiophylla Fernald
3463	norvegica Gunner, var. pleiophylla Fernald

Fernald, Wiegand & Bartram

5457	glabella Pursh
5458	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
5458a	glabella Pursh
5459	norvegica Gunner

Fernald, Wiegand & Darlington

5460	norvegica Gunner
5461	arabisans Michx.
5462	arabisans Michx.
5463	arabisans Michx.

Fernald, Wiegand & Kittredge

3452	incana L.

3454 incana L., var. confusa (Ehrh.) Liljebl.
3455 rupestris R. Br.
3457 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
3459 arabisans Michx.

Fernald, Wiegand & Long

28,263 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
28,347 nivalis Liljebl.
28,351 incana L., var. confusa (Ehrh.) Liljebl.
28,391 norvegica Gunner
28,405 norvegica Gunner
28,406 norvegica Gunner and glabella Pursh
24,412 norvegica Gunner, var. pleiophylla Fernald
28,413 norvegica Gunner

Fernald, Wiegand, Long, Gilbert & Hotchkiss

28,354 incana L., var. confusa (Ehrh.) Liljebl.
28,356 glabella Pursh
28,392 norvegica Gunner
28,393 norvegica Gunner
28,394 norvegica Gunner, var. pleiophylla Fernald
28,411 norvegica Gunner

Fernald, Wiegand, Pease, Long, Griscom, Gilbert & Hotchkiss

20,380 norvegica Gunner, var. pleiophylla Fernald
28,350 incana L., var. confusa (Ehrh.) Liljebl.
28,374 norvegica Gunner
28,380 norvegica Gunner, var. pleiophylla Fernald
28,382 norvegica Gunner
28,383 norvegica Gunner, var. pleiophylla Fernald
28,384 norvegica Gunner
28,385 norvegica Gunner, var. hebecarpa (Lindbl.) O. E. Schulz
28,386 norvegica Gunner
28,387 norvegica Gunner, var. hebecarpa (Lindbl.) O. E. Schulz
28,388 norvegica Gunner

Gardner, G.

317a glabella Pursh
377 glabella Pursh

Gooding, L. M.

1404 aurea M. Vahl

Griscom, Ludlow

28,364 laurentiana Fernald

Griscom, Mackenzie & Smith

25,770 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald

Griscom & Pease

25,775 clivicola Fernald
25,776 clivicola Fernald

House, H. D.

9436 arabisans Michx.

Johansen, Frits

93,671 incana L., var. confusa (Ehrh.) Liljebl.

Kelsey & Jordan

65 glabella Pursh

Kennedy, R. B.

1 incana L., var. confusa (Ehrh.) Liljebl.
2 incana L., var. confusa (Ehrh.) Liljebl.
3 incana L., var. confusa (Ehrh.) Liljebl.

Low, A. P.

63,140 norvegica Gunner
63,143 glabella Pursh
63,144 glabella Pursh
63,145 aurea M. Vahl
63,146 aurea M. Vahl

McFarlin, J. B.

2174 arabisans Michx.
2246 arabisans Michx.

Mackenzie & Griscom

10,268 arabisans Michx.
10,269 arabisans Michx.
11,079 glabella Pursh
11,089a incana L.

Macoun, J. M.

1920 minganensis (Victorin) Fernald
79,065 glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
79,066 glabella Pursh
79,068 glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald

79,069	alpina L.
79,070	nemorosa L., var. lejocarpa Liljebl.
79,072	alpina L., var. nana Hook. and fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball

Macoun, John

19	incana L., var. confusa (Ehrh.) Liljebl.
20	arabisans Michx.
178	nemorosa L., var. lejocarpa Liljebl.
477	nemorosa L., var. lejocarpa Liljebl.
2014	nemorosa L., var. lejocarpa Liljebl.
10,276	aurea M. Vahl
18,987	norvegica Gunner

Malte, M. O.

118,919	glabella Pursh, var brachycarpa (Rupr.) Fernald
119,988	alpina L.
120,038	fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
120,062	fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
120,092	crassifolia Graham
120,098	nivalis Liljebl.
120,136	fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
120,136a	fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
120,159	nivalis Liljebl.
120,198	glabella Pursh, var. brachycarpa (Rupr.) Fernald
120,203	glabella Pursh
120,209	glabella Pursh
120,243	glabella Pursh, var. brachycarpa (Rupr.) Fernald

Patterson, H. N.

7	aurea M. Vahl

Payson & Payson

5024	aurea M. Vahl

Pease, A. S.

5094	glabella Pursh
5437	pycnosperma Fern. & Knowlt.
5450	pycnosperma Fern & Knowlt.
7350	glabella Pursh
7353	glabella Pursh
7355	arabisans Michx.
7356	arabisans Michx.
7357	glabella Pursh
7358	glabella Pursh
7359	pycnosperma Fern. & Knowlt.
7361	pycnosperma Fern. & Knowlt.
11,981	arabisans Michx.
19,227	glabella Pursh
19,239	pycnosperma Fern. & Knowlt.
20,159	glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
20,194	Peasei Fernald
20,205	arabisans Michx.
20,208	arabisans Michx.
20,219	incana L.
20,241	arabisans Michx.
20,242	pycnosperma Fern. & Knowlt.
20,614	lanceolata Royle
23,487	arabisans Michx.
23,633	arabisans Michx.

Pease & Griscom

28,342	nivalis Liljebl.
28,357	laurentiana Fernald
28,377	norvegica Gunner
28,378	norvegica Gunner, var. pleiophylla Fernald
28,379	glabella Pursh

Pease & Long

28,359	laurentiana Fernald
28,360	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
[28,390	norvegica Gunner

Pease, Long & Gilbert

28,373	norvegica Gunner

Pease & Smith

25,771	clivicola Fernald
25,774	clivicola Fernald

Perry & Myers

750	aprica Beadle
751	aprica Beadle

Potter, David

546	minganensis (Victorin) Fernald
549	norvegica Gunner
584	incana L., var. confusa (Ehrh.) Liljebl.

Povah, Brown & McFarlin

3671B	incana L.

Priest, M. E.

E1 laurentiana Fernald

Rolland-Germain

15,640 arabisans Michx., var. canadensis (Brunet) Fernald & Knowlt.

Rousseau, Jacques

24,831 glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
24,833 arabisans Michx.
24,841 arabisans Michx.
26,322 arabisans Michx., var. canadensis (Brunet) Fern. & Knowlt.
26,353 glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
26,389 glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
26,442 glabella Pursh
26,487 arabisans Michx.
26,503 glabella Pursh
26,508 glabella Pursh
26,548 glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
26,582 minganensis (Victorin) Fernald
26,585 lanceolata Royle
26,613 arabisans Michx.
26,695 arabisans Michx.
26,703 arabisans Michx.
31,007 minganensis (Victorin) Fernald
31,072 glabella Pursh
31,150 pycnosperma Fern. & Knowlt.
31,151 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
31,214 incana L.
31,222 incana L.
31,223 glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
32,335 arabisans Michx.

Rydberg, P. A.

516 aurea M. Vahl
9666 arabisans Michx.

St. John, Harold

1890 incana L., var. confusa (Ehrh.) Liljebl.
1893 incana L., var. confusa (Ehrh.) Liljebl.
90,475 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
90,476 glabella Pursh
90,477 incana L.
90,478 incana L., var. confusa (Ehrh.) Liljebl.
90,479 incana L., var. confusa (Ehrh.) Liljebl.
90,480 incana L., var. confusa (Ehrh.) Liljebl.
90,481 incana L., var. confusa (Ehrh. Liljebl.
90,482 incana L., var. confusa (Ehrh.) Liljebl.
90,484 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
90,485 glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald

Schmitt, C.

289 alpina L.

Sewall, C. S.

40 incana L.
77 (in part) incana L., var. confusa (Ehrh.) Liljebl.
79 incana L.
169 incana L., var. confusa (Ehrh.) Liljebl.
516 nivalis Liljebl.
519 glabella Pursh

Sornborger, J. D.

61 Sornborgeri Fernald
70 incana L.
173 glabella Pursh
175 crassifolia Graham and Sornborgeri Fernald

Spreadborough, W.

16,272 glabella Pursh

Stebbins, G. L., jr.

783 arabisans Michx.

Stebbins et al.

143 lanceolata Royle
144 lanceolata Royle

Stecker, Adolph

212x fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
216 aurea M. Vahl

Turner, L. M.

4842	glabella Pursh
6316	glabella Pursh

Victorin, Marie-

30	glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
573	glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
3140	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
3203	glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
3867	arabisans Michx.
4128	arabisans Michx.
4134	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
4139	incana L.
9587	glabella Pursh
15,638	arabisans Michx.
15,639	arabisans Michx.
24,839	arabisans Michx.

Victorin, Brunel & Rousseau

17,376	pycnosperma Fernald & Knowlton
17,377	pycnosperma Fernald & Knowlton

Victorin & Rolland

9484	incana L., var. confusa (Ehrh.) Liljebl.
9485	incana L., var. confusa (Ehrh.) Liljebl.
9486	incana L., var. confusa (Ehrh.) Liljebl.
18,244	laurentiana Fernald
18,245	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fern.
18,246	laurentiana Fernald
18,247	incana L., var. confusa (Ehrh.) Liljebl.
18,248	incana L., var. confusa (Ehrh.) Liljebl.
18,249	incana L., var. confusa (Ehrh.) Liljebl.
18,250	incana L., var. confusa (Ehrh.) Liljebl.
18,251	laurentiana Fernald
18,252	laurentiana Fernald
18,253	laurentiana Fernald
18,254	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
18,255	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
18,256	laurentiana Fernald
18,257	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
18,383	glabella Pursh
21,032	incana L.
21,465	incana L., var. confusa (Ehrh.) Liljebl.
21,466	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
21,469	glabella Pursh, var. orthocarpa (Fern. & Knowlt.) Fernald
21,471	glabella Pursh
21,472	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
21,475	incana L., var. confusa (Ehrh.) Liljebl.
21,476	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
21,477	laurentiana Fernald
21,478	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
21,481	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
24,828	minganensis (Victorin) Fernald
24,861	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
24,862	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
24,863	laurentiana Fernald
24,864	incana L.
24,865	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
24,866	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
24,867	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
24,869	glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
27,192	incana L.
27,310	incana L.

27,311 incana L.
27,312 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
27,313 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
27,314 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald

Victorin, Rolland, Brunel & Rousseau

17,375 pycnosperma Fernald & Knowlton
17,378 arabisans Michx.
17,379 pycnosperma Fernald & Knowlton
17,380 pycnosperma Fernald & Knowlton
17,381 incana L.
17,382 arabisans Michx.
17,383 arabisans Michx.
17,384 incana L.
17,386 incana L.
17,387 pycnosperma Fernald & Knowlton

Victorin, Rolland & Jacques

33,437 arabisans Michx.
33,586 arabisans Michx.
33,675 nivalis Liljebl.
33,676 glabella Pursh
33,774 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald

Victorin, Rolland & Louis-Marie

21,467 incana L.
21,468 incana L.
21,473 incana L.
21,474 glabella Pursh
21,479 incana L.

Waghorne, A. C.

14 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald
19 glabella Pursh
22 arabisans Michx.
27 norvegica Gunner

Wetmore, R. H.

102,959 incana L.

Wiegand, Gilbert & Hotchkiss

28,353 incana L., var. confusa (Ehrh.) Liljebl.
28,368 arabisans Michx.
28,375 norvegica Gunner
28,376 norvegica Gunner
28,389 norvegica Gunner
28,395 norvegica Gunner

Wiegand, Griscom & Hotchkiss

28,348 incana L.
28,360 laurentiana Fernald
28,361 glabella Pursh, var. megasperma (Fern. & Knowlt.) Fernald

Wolf & Rothrock

634 aurea M. Vahl

Woodworth, R. H.

239 fladnizensis Wulfen, var. heterotricha (Lindbl.) Ball
240 nivalis Liljebl.
240½ glabella Pursh

EXPLANATION OF PLATES 290–319

Plate 290. Draba alpina L. Fig. 1, flowering plant, × 1, from Dovre, Norway, July, 1902, *Gustaf Peters;* fig. 2, small fruiting plant, × 1, from Torne Lappmark, July 21, 1924, *Carl G. Alm;* fig. 3, portion of rosette, × 10, to show long ciliation, from same collection as fig. 2; fig. 4, summit of scape, × 10, from same collection as figs. 2 and 3; fig. 5, fruiting plant, × 1, of var. nana Hook., from Mansfield Island, Hudson Bay, August 30, 1884, *R. Bell* (isotype of *D. Bellii* Holm); fig. 6, flowering plant × 1, of var. nana, from North Star Bay, Thule, northwest Greenland, *W. E. Ekblaw*, no. 411; fig. 7, leaves, × 10, of no. 411.

Plate 291. D. fladnizensis Wulfen, var. heterotricha (Lindblom) Ball. Fig. 1, small plant in flower, × 1, from North Star Bay, northwestern Greenland, *Ekblaw*, no. 421; fig. 2, fruiting plant, × 1, from East Bay, Ikordlearsuk, Labrador, *Abbe & Odell*, no. 382; fig. 3, tips of leaves, × 10, from *Ekblaw*, no. 421; figs. 4 and 5, valve and septum, × 10, from Torne Lappmark, Sweden, August 27, 1917, *Carl G. Alm.*

Plate 292. D. Allenii Fernald, n. sp. Fig. 1, small piece of flowering plant, × 1, from Pease Basin, between Mts. Logan and Pembroke, Matane Co., Quebec, *Fernald et al.*, no. 25,782; fig. 2, small piece of fruiting plant from Tabletopped Mountain, Gaspé Co., Quebec, August 10, 1881, *J. A. Allen;* fig. 3, portion of rosette, × 10, from Fernald Pass, Mt. Mattaouisse, Quebec, *Fernald et al.*, no. 25,779 (type of species); fig. 4, flowers from no. 25,782; figs. 5 and 6, valve and septum, with seeds, × 10, from fig. 2.

Plate 293. D. rupestris R. Br. Fig. 1, small flowering plant, × 1, from the type locality, Ben Lawers, Scotland, *Arnott;* fig. 2, fruiting plant from Pointe Riche, Newfoundland, *Fernald & Wiegand*, no. 3455; fig. 3, flowering plant from Battle Island, Labrador, August 3, 1913, *W. E. Ekblaw;* fig. 4, rosette-leaves, × 10, from Pointe Riche, Newfoundland, no. 3455.

Plate 294. D. crassifolia Graham. Fig. 1, three of the original specimens, × 1, from summits of the Rocky Mts., *Drummond;* fig. 2, two plants, × 1, from Ramah, Labrador, *Sornborger*, no. 175; fig. 3, fruiting plant, × 1, from Disco, Greenland, June 28, 1924, *M. P. Porsild;* fig. 4, flowering plant, × 1, from Disco, June 27, 1929, *R. T. Porsild;* fig. 5, leaf and base of scape, × 10, from Ramah, *Sornborger*, no. 175; fig. 6, flower, × 10, from Disco, Greenland, June 27, 1929, *R. T. Porsild.*

Plate 295. D. nivalis Liljeblad and D. Peasei Fernald, n. sp. Fig. 1, flowering plant, × 1, of D. nivalis, from North Star Bay, Thule, northwestern Greenland, *Ekblaw*, no. 238; fig. 2, fruiting plant, × 1 of D. nivalis from Hayes Harbor, near Etah, Greenland, *Ekblaw*, no. 239; fig. 3, rosette-leaves, × 10, of D. nivalis from Little Quirpon, Newfoundland, *Fernald & Long*, no. 28,343; fig. 4, type of D. Peasei, × 1, from Cape Rosier, Quebec, *Pease*, no. 20,194; fig. 5, tips of rosette-leaves of D. Peasei, × 10, from the type; fig. 6, valve, × 10, of D. Peasei, from the type; fig. 7, septum and seeds, × 10, of D. Peasei, from the type.

Plate 296. D. aurea M. Vahl. Fig. 1, small flowering plant, × 1, from Upernivik Ø, Sandsten, Greenland, 14 Juli 1929, *M. P. & R. T. Porsild;* fig. 2, fruiting stem, × 1, from same collection as fig. 1; fig. 3, large fruiting plant, × 1, from Sheep Mt., Waterton Lake, Alberta, *J. Macoun*, no. 10,276.

Plate 297. D. minganensis (Victorin) Fernald, n. sp., and D. luteola Greene. Figs. 1, 2 and 3, small flowering plants of D. minganensis, × 1, from Île Nue, Archipel de Mingan, Quebec, *Victorin & Rolland*, no. 24,828 (isotypes of *D. luteola*, var. *minganensis* Victorin); fig. 4, flower from isotype of D. minganensis, × 10, showing villous sepals; fig. 5, dwarf (starved) plant of D. minganensis, × 1, from under Cap Original, Bic, Quebec, *Fernald & Collins*, no. 578; fig. 6, fruiting plant of D. luteola, × 1, from near Pagosa Peak, Colorado, *C. F. Baker*, no. 351; fig. 7, silique, × 10, of no. 351.

Plate 298. D. minganensis (Victorin) Fernald, n. sp. Fig. 1, fruiting plant, well developed, × 1, from Cap Enragé, Bic, Quebec, July 8, 1905, *Williams, Collins & Fernald;* fig. 2, portion of inflorescence, × 10, showing the villous sepals and villous-hirsute ovary, from Cap Enragé, *Fernald & Collins*, no. 1065; fig. 3, upper half of silique, × 10, from no. 1065.

Plate 299. D. incana L., var. confusa (Ehrh.) Liljeblad, figs. all × 1. Fig. 1, small plant, showing leafy to leafless fruiting stems (2 stems at left = var. *nana* Lindbl.) from Ile Kécarpoui, Archipel de Kécarpoui, Quebec, *St. John*, no. 90,480; fig. 2, dwarfed xerophytic extreme (isotype of var. *conica*

O. E. Schulz), from Cap Barré, Percé, Quebec, *Collins & Fernald*, no. 89; FIG. 3, plant from moist and fertile habitat, Cow Head, Newfoundland, *Fernald & Wiegand*, no. 3453; FIG. 4, dwarf xerophytic plant, with leafless or few-leaved stems (var. *nana* Lindbl.), from Sandy Cove, Ingornachoix Bay, Newfoundland, *Fernald, Long & Dunbar*, no. 26,709; FIG. 5, slender plant from same station as FIG. 2; FIG. 6, leafy plant (var. *stricta* Hartm.) from Îlets de la Baie à Jean, Quebec, *Victorin & Rolland*, no. 18,249.

PLATE 300. D. SORNBORGERI Fernald, n. sp., and D. CRASSIFOLIA Graham, var. PARRYI (Rydb.) O. E. Schulz. FIG. 1, TYPE, × 1, of D. SORNBORGERI, from Ramah, Labrador, *Sornborger*, no. 61; FIG. 2, flower, × 10, of D. SORNBORGERI, from Ramah, *Sornborger*, no. 175 in part; FIG. 3, valve, × 1, from TYPE of D. SORNBORGERI; FIGS. 4 and 5, plants, × 1, of D. CRASSIFOLIA, var. PARRYI from Gray's Peak and vicinity, Colorado, *Patterson*, no. 6.

PLATE 301. D. NORVEGICA Gunner. FIG. 1, small fruiting plant, × 1, from Aurland, Norway, August 12, 1928, *Johannes Lid;* FIG. 2, dwarf plant in flower, × 1, from Deadman Cove, Newfoundland, *Wiegand, Gilbert & Hotchkiss*, no. 28,376; FIG. 3, small flowering plant, × 1, from Crow's Head, St. John Bay, Newfoundland, *Fernald, Long & Fogg*, no. 1743; FIG. 4, fragment of flowering mat (of 20 stems), × 1, from Flower Cove, Newfoundland, *Fernald, Griscom & Gilbert*, no. 28,372; FIG. 5, fragment of fruiting plant, × 1, from Piton Point, Newfoundland, *Wiegand, Gilbert & Hotchkiss*, no. 28,395; FIG. 6, tips of rosette-leaves, × 10, from 28,376.

PLATE 302. D. NORVEGICA Gunner, var. PLEIOPHYLLA Fernald, n. var. FIG. 1, portion of fruiting plant, × 1, from Ha-Ha Mountain, Newfoundland, *Fernald & Long*, no. 28,399; FIG. 2, flowering plant, × 1, from Burnt Cape, Newfoundland, *Fernald et al.*, no. 20,380 (TYPE of the variety); FIG. 3, bases of rosette-leaves and lowest internode, × 10, from Big Brook, Newfoundland, *Fernald & Long*, no. 28,407; FIG. 4, silique, × 10, from no. 28,399.

PLATE 303. D. CLIVICOLA Fernald, n. sp. FIG. 1, flowering plant, × 1, of the TYPE collection, Big Chimney, Mt. Mattaouisse, Quebec, *Dodge, Griscom & Pease*, no. 25,773; FIG. 2, fruiting plant, × 1, of TYPE collection; FIG. 3, portion of internodes, × 10, from Mt. Pembroke, Quebec, *Griscom & Pease*, no. 25,775; FIG. 4, tip of rosette-leaf, × 10, from Fernald Pass, Mt. Mattaouisse, *Fernald & Smith*, no. 25,777; FIG. 5, portion of inflorescence, × 10, from no. 25,775; FIG. 6, valve of ripe silique, × 10, from Mt. Pembroke, *Fernald & Smith*, no. 25,778.

PLATE 304. D. LAURENTIANA Fernald, n. sp. FIG. 1, small flowering plant, × 1, from Flower Cove, Newfoundland, *Fernald, Griscom & Gilbert*, no. 28,355; FIG. 2, portion of flowering plant (divided), × 1, from Îlets Perroquets, Archipel de Mingan, Quebec, *Victorin & Rolland*, no. 18,252; FIG. 3, portion of internode, × 10, from the TYPE, Grassy Island, St. John Bay, Newfoundland, *Fernald, Long & Fogg*, no. 1731; FIG. 4, valve of ripe silique, × 10, from the TYPE, no. 1731.

PLATE 305. D. LAURENTIANA Fernald, n. sp. FIG. 1, fruiting stem, × 1, from the TYPE, Grassy Island, St. John Island, Newfoundland, *Fernald, Long & Fogg*, no. 1731; FIG. 2, portion of basal-rosette, × 10, from the TYPE; FIG. 3, flower, × 10, from Flower Cove, Newfoundland, *Fernald, Griscom & Gilbert*, no. 28,355.

PLATE 306. D. PYCNOSPERMA Fernald & Knowlton. FIG. 1, small fruiting plant, × 1, from Île Bonaventure, Gaspé Co., Quebec, *Victorin, Rolland,*

Brunel & Rousseau, no. 17,376; FIG. 2, portion of young basal rosette, × 10, from Bonaventure Island, *Fernald & Collins*, no. 1073; FIG. 3, portion of internode, × 10, from Cap Blanc, Percé, Quebec, *Collins & Fernald*, no. 94; FIG. 4, septum and characteristically crowded seeds, × 10, from no. 94; FIG. 5, outer surface of valve, × 10, from no. 94.

PLATE 307. D. GLABELLA Pursh. FIG. 1, flowering plant, × 1, from St. Anthony, Newfoundland, *Abbe & Brooks*, no. 365; FIG. 2, flowering plant, × 1, from Cape Mugford Peninsula, Labrador, *Abbe*, no. 371; FIG. 3, fruiting stems, × 1, from mouth of Frazer River, Labrador, *Bishop*, no. 325 (near Nain, type-region of *D. Henneana* Schlechtend.); FIG. 4, portion of basal rosette, × 10, from New World Island, Newfoundland, *Fernald, Wiegand & Bartram*, no. 5457; FIG. 5, portion of internode, × 10, from Port Manvers, Labrador, *Dutilly & Gardner*, no. 317 a; FIG. 6, upper half of silique, × 10, from *Fernald, Wiegand & Bartram*, no. 5457.

PLATE 308. D. GLABELLA Pursh, all figs. × 1. FIG. 1, one of the 3 identical TYPE plants of D. GLABELLA in Herb. Brit. Mus. (from photograph presented by the Keeper, Mr. J. Ramsbottom); FIG. 2, type of D. HENNEANA Schlechtendal in Herb. Bot. Mus. Berlin-Dahlem (photographed by Dr. L. B. Smith from the original specimen loaned by the Curator, Prof. Johannes Milbraed); FIG. 3, TYPE of D. DAURICA DC. in Herb. DeCandolle (from photograph presented by Dr. Alfred Becherer and Mr. J. Francis Macbride).

PLATE 309. D. GLABELLA Pursh, var. ORTHOCARPA (Fernald & Knowlton) Fernald. FIG. 1, small plant, × 1, of the TYPE collection of *D. arabisans*, var. *orthocarpa* Fernald & Knowlton, from Bic, Quebec, July 15–18, 1904, *Collins & Fernald;* FIG. 2, septum and seeds, × 10, from the TYPE; FIG. 3, valve, × 10, from the TYPE (note the veiny surface as in D. GLABELLA, as contrasted with the essentially veinless silique of D. ARABISANS).

PLATE 310. D. GLABELLA Pursh, var. BRACHYCARPA (Ruprecht) Fernald. FIG. 1, fruiting stems, × 1, from Disco, Greenland, August 12, 1902, *M. P. Porsild;* FIG. 2, flowering plant, × 1, from Godhavn, Greenland, *Simmons*, no. 16; FIG. 3, silique, × 10, from same plant as fig. 2; FIG. 4, septum and seeds, × 10, from fig. 2.

PLATE 311. D. GLABELLA Pursh, var. MEGASPERMA (Fernald & Knowlton) Fernald. FIG. 1, portion of flowering plant from Vieille Romaine, Archipel Ouapitagone, Quebec, *St. John*, no. 90,484; FIG. 2, portion of fruiting plant, × 1, from Île St. Charles, Archipel de Mingan, Quebec, *Victorin & Rolland*, no. 18,254; FIG. 3, portion of fruiting plant, × 1, from Forteau, Labrador, *Fernald & Wiegand*, no. 3457.

PLATE 312. D. GLABELLA Pursh, var. MEGASPERMA (Fernald & Knowlton) Fernald. Figs., × 10, all from the TYPE of *D. megasperma* Fernald & Knowlton: Paspebiac Lighthouse, Quebec, July 26, 1902, *Williams & Fernald.* FIG. 1, portion of basal rosette; FIG. 2, portion of lowest (fractured) internode; FIG. 3, valve of ripe silique; FIG. 4, septum and seeds.

PLATE 313. D. MCCALLAE Rydberg. FIG. 1, one of the two flowering plants, × ½, from valley below Mt. Aylmer, near Banff, Alberta, *McCalla*, no. 2267 (TYPE of species); FIG. 2, fruiting stem, × ½, from Larch Valley, Banff, *N. B. Sanson*, no. 82; FIG. 3, rosette-leaves, × 10, from head of Ptarmigan Valley, Alberta, *S. Brown*, no. 387; FIG. 4, portion of lower internode, × 10, from no. 387; FIG. 5, portion of flower, × 10, from TYPE, to show pilose ovary; FIG. 6, silique, × 10, from *Sanson*, no. 82.

PLATE 314. D. ARABISANS Michx. FIG. 1, portion of flowering branch, × 1, from Jack Fish, Ontario, *Pease & Bean*, no. 23,487; FIG. 2, fruiting branch, × 1, from the type region, Gardiner's Island, Lake Champlain, Vermont, June 17, 1881, *Faxon;* FIG. 3, characteristically forking fruiting branch, × 1, from St. Fabien, Quebec, *Fernald & Collins*, no. 1068; FIG. 4, fruiting raceme, × 1, from the type region, Shelburne Point, Lake Champlain, Vermont, June 25, 1913, *C. H. Knowlton;* FIG. 5, silique, × 10, showing characteristically smooth valve, from the type region, Lake Champlain, Vermont, July 3, 1902, *W. R. Davis;* FIG. 6, small rosette-leaf, × 10, from Hannah's Head, Newfoundland, *Fernald, Long & Fogg*, no. 1733.

PLATE 315. D. ARABISANS Michx. and var. CANADENSIS (Brunet) Fernald & Knowlton. FIG. 1, portion of fruiting branch, × 1, of short-fruited plant of D. ARABISANS, from Bic, Quebec, *Collins & Fernald*, no. 93 (isotype of *D. megasperma*, var. *leiocarpa* O. E. Schulz); FIG. 2, short fruiting raceme of D. ARABISANS, × 1, from Mt. Ste. Anne, Percé, Quebec, *Fernald & Collins*, no. 1070; FIG. 3, fruiting raceme, × 1, of var. CANADENSIS from Cape Tourmente, Quebec, *Brunet* (ISOTYPE of *D. canadensis* Brunet); FIG. 4, portion of plant, × 1, approaching var. CANADENSIS, from Tucker's Head, Newfoundland, *Fernald, Long & Fogg*, no. 1749; FIG. 5, silique, × 10, of *Collins & Fernald*, no. 93 (isotype of *D. megasperma*, var. *leiocarpa*); FIG. 6, silique, × 10, of ISOTYPE of D. CANADENSIS Brunet.

PLATE 316. D. LANCEOLATA Royle. FIG. 1, portion of slender fruiting plant, × 1, from Bic, Quebec, *Fernald & Collins*, no. 1077; FIG. 2, portion of slender fruiting plant, × 1, from Smoky Head, Bruce Co., Ontario, *Stebbins et al.*, no. 143; FIG. 3, center of basal rosette, × 10, from Mt. St. Pierre, Quebec, *Fernald, Weatherby & Stebbins*, no. 2446; FIG. 4, portion of internode, × 10, from Bic, Quebec, *Fernald & Collins*, no. 1077; FIG. 5, silique, × 10. from Willoughby Mt., Vermont, June 25, 1884, *Faxon.*

PLATE 317. D. LANCEOLATA Royle. FIG. 1, flowering plant, × 1, from Ajan, eastern Siberia, *Tiling*, no. 40; FIG. 2, fruiting plant, × 1, from Songaria, *Schrenk;* FIG. 3, flowering stem, × 1, from Willoughby Mt., Vermont, May 22, 1878, *Pringle;* FIG. 4, portion of fruiting plant from Bic, Quebec, *Rousseau*, no. 26,585; FIG. 5, fruiting plant, × 1, from Fish Lake, Uintah Mts., Utah, *Goodding*, no. 1402 (isotype of *D. valida* Goodding).

PLATE 318. D. LANCEOLATA Royle. FIG. 1, type, × 1, of *D. cana* Rydb., from Morley, Alberta, June 12, 1887, *J. Macoun* (herb. N. Y. Bot. Garden); FIG. 2, lax plant, × 1, from eastern Siberia, *Studendorff.*

PLATE 319. D. BRACHYCARPA Nutt. (FIGS. 1–7), D. BRACHYCARPA, var. FASTIGIATA Nutt. (FIGS. 11 and 12) and D. APRICA Beadle (FIGS. 8–10). FIG. 1, subsimple fruiting plant of D. BRACHYCARPA, × 1, from Sullivan Co., Indiana, *Deam*, no. 26,921; FIG. 2, small-flowered, subsimple plant, × 1, from Jackson, Tennessee, *Bain*, no. 389; FIG. 3, large-flowered, subsimple plant, × 1, from Bedford Co., Virginia, *Curtiss*, no. 178; FIG. 4, small branching plant, with large flowers, × 1, from St. Louis, Missouri, *Engelmann;* FIG. 5, small branching and fruiting plant from Knoxville, Tennessee, *Ruth*, no. 349; FIGS 6, silique, × 10, from no. 349; FIG. 7, septum and seeds, × 10, from no. 349; FIG. 8, fruiting plant (divided), × 1, one of the TYPE specimens of D. APRICA (herb. N. Y. Bot. Gard.); FIG. 9, silique, × 10, from the TYPE; FIG. 10, septum and seed, × 10, from the TYPE; FIG. 11, fruiting plant, × 1, one of the two TYPE specimens of D. BRACHYCARPA, var. FASTIGIATA (herb. N. Y. Bot. Gard.); FIG. 12, silique, × 10, from TYPE of var. FASTIGIATA.

NOTES ON THE FLORA OF NORTHERN NEW YORK

W. C. Muenscher and R. T. Clausen

The material on which these notes are based was collected during the summers of 1930–1933. The species are listed because they are either apparent additions to the New York state flora or the records add to our knowledge of their distribution in this state. The names of the collectors are abbreviated as follows: *C.*, R. T. Clausen; *L.*, A. A. Lindsey; *B.M.*, Bassett Maguire; *M.*, W. C. Muenscher.

Najas gracillima (A. Br.) Magnus. This coastal species was reported by Fernald[1] as occurring locally inland as far as Saratoga County, N. Y. where Svenson collected it in shallow water of the Hudson River above Waterford, in 1922. Since then several other collections have been made from points farther inland: 1930, in Massawepie Lake, St. Lawrence Co., *M. & B.M.*, no. 703; 1931, in Indian River between Rossie and Black Lake, St. Lawrence Co., *M. & B.M.*, no. 1809; 1933, in Russel Pond, St. Lawrence Co., *M. & C.*, no. 3746, and dredged at depth of two meters in Blue Mountain Lake, Hamilton Co., *M. & C.*, no. 3744.

All of this material appears quite typical of the species. The leaf blades are extremely narrow, with the broadened bases both scarious and ciliate. The fruits are slender, rather dull in luster, and roughened by the longitudinal rows of areolae.

Anacharis occidentalis (Pursh) Marie-Victorin. Dredged in two meters of water, Catlin Lake, Hamilton Co., 1932, *M. & L.*, no. 2906; dredged in Long Pond, Catlin Lake, *M. & L.*, no. 2907; Efner Lake, Saratoga Co., *M. & L.*, no. 2908; in shallow water, Algonquin Lake, Hamilton Co., *M. & L.*, no. 2909. Reported by House[2] only from the southeastern part of the state.

Aristida basiramea Engelm. Dry sandy plains by Russel Pond, South Colton, St. Lawrence Co., 1933, *M. & C.*, no. 3976. Middle awns coiled at base, 1.5–1.8 cm. long; lateral awns 6–9 cm. long; glumes 10–11 cm. long.

This grass occurred over a considerable area and seemed well established, with no indication that it had been introduced, although that remains a possibility. There is only one other published record of the occurrence of this species in the East. This is the record of Wheeler[3] who found the plant at Bethel, in the valley of the Androscoggin River, in Maine. Prof. Fernald has kindly informed us, however, of the following unpublished collections, which cause us to suspect that possibly this *Aristida* is actually native on open arid soils as far east as western Maine. On Aug. 27, 1931, Fernald and Griscom collected the plant on the sandy shores of the Merrimack River at Bedford, N. H. During the summer of 1933, Weatherby and Griscom found it in another township on the opposite bank of the Merrimack in New Hampshire. In 1931, Fernald found the plant in abundance on the open sand plains of Lake Champlain south of Keeseville, N. Y., where it was associated with *Cyperus Houghtonii* and other sand-plain plants and appeared in every way indigenous.

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[1] Fernald, M. L. Rhodora, **25: 105–109.** 1923.

[2] House, H. D. New York State Museum Bulletin **254: 65.** 1924.

[3] Wheeler, L. A. Rhodora **31: 78–79.** 1929.

CALAMAGROSTIS CANADENSIS (Michx.) Beauv., var. ROBUSTA Vasey and var. LANGSDORFI (Link) Inman. Specimens collected on the summit of Mount MacIntyre (about 5,000 ft.), Essex Co., *M. & B. M.*, nos. 915 and 916; *M. & C.*, no. 3977 had spikelets which varied from 3.8–4.2 mm. in length, averaging about 4 mm. The margins of the glumes tended to he hyaline. This material falls within the limits of var. *robusta* as outlined by Stebbins.[1] *M. & L.*, no. 2927 from Lake Tear, Mount Marcy, Essex Co., with spikelets measuring from 4–4.5 mm., is probably also var. *robusta*. No. 222 collected in 1930 by Muenscher, Manning and Maguire from near the summit of Mount Whiteface, Essex Co., had spikelets measuring from 4.5–5 mm. in length. This seems to be rather typical var. *Langsdorfi*.

The large-spikelet forms of *C. canadensis* still present a puzzling aspect. The material of var. *Langsdorfi* and of var. *robusta* in the Cornell University Herbarium was studied, using Stebbins' paper as a guide. Only two numbers cited by him as typical of var. *Langsdorfi* were represented by sheets in this herbarium. These were no. 884, *Fernald and Collins*, from Bonaventure Island, Gaspé Co., Quebec, and no. 27488, *Fernald and Long*, from Newfoundland. The spikelets of these sheets were found to average about 4 mm. in length in each case, 3.8–4.4 mm. being the range of variation. This seems to place them within the limits (3.8–4.5) given by Stebbins for var. *robusta*, instead of var. *Langsdorfi*. Several uncited sheets of large-spikelet forms of *C. canadensis* from Newfoundland and Quebec, in the Cornell herbarium were labelled var. *Langsdorfi*, but also had spikelets which came within the limits given by Stebbins for var. *robusta*. There were no sheets from the Northeast in this herbarium, with the exception of the collection from Mt. Whiteface mentioned above, which had spikelets within Stebbins' limits (4.5–6 mm.) for var. *Langsdorfi*.

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[1] Stebbins, G. L., Jr. RHODORA **32**: 35–37. 1930.

Allionia nyctaginea Michx. Along New York Central tracks at Palatine Bridge, Montgomery Co., *M. & L.*, no. 3242; along roadside, Yosts, Montgomery Co., *M. & L.*, no. 3243; common along Route 5 between Fonda and Canajoharie, two miles west of Fonda, Montgomery Co., *M. & L.*, no. 3241.

Raphanus raphanistrum L. Field near Broadalbin, Fulton Co., 1932, *M. & L.*, no. 3343. A form with white flowers, with veins of petals greenish when fresh, was found growing with the typical yellow-flowered form.

Astragalus canadensis L. On lake shore, Turnbull's Beach, Black Lake, St. Lawrence Co., 1931, *M. & B. M.*, no. 2358. Reported by House[1] as infrequent from Onondaga, Cayuga and Broome counties westward.

Elatine minima (Nutt.) Fisch. & Meyer. Submerged on sandy bottom along southeast shore of Osgood Pond, Franklin Co., 1930, *M. & B. M.*, no. 1258. Rather common on sandy shore of Big Wolf Pond in Franklin Co., 1933, *M. & C.*, no. 3912.

Myriophyllum Farwellii Morong. Abundant in shallow water in Bradley Pond, Clinton Co., 1930, *M. & B. M.* no. 1272. Mature carpels with tuberculate ridges. Three collections were made in the Raquette River watershed during 1933: Colton Flow, St. Lawrence Co., *M. & C.*, no. 3916; Beaver Bay of Raquette Lake, Hamilton Co., *M. & C.*, no. 3917; in shallow water of South Bay, Tupper Lake, Franklin Co., *M. & C.*, no. 3918.

Dipsacus laciniatus L. Growing on waste ground west of Saratoga, 1932, *M. & L.*, no. 3636. Previously reported from Albany by House.

Specimens from all of the above collections have been deposited in the herbarium of Cornell University.

Cornell University.

Notes on Virginia and Maryland Plants.—The three following plants collected by the writer during the summers of 1932 and 1933 in the Blue Ridge Mountains of Page County, Virginia, seem to be worthy of record.

Muhlenbergia racemosa (Michx.) BSP. This plant was collected at an altitude of about 3500 ft. near Crescent Rocks, just below the edge of one of the cliffs characteristic of the western slope of the Blue Ridge in Page County. The solitary clump was growing in the moist soil near the source of a spring. According to Dr. A. S. Hitchcock, it has not previously been reported from Virginia.

Solidago Randii (Porter) Britton. This species is common along the western cliffs above 3500 ft., from Hawkesbill to Stony Man

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[1] House, H. D. New York State Museum Bulletin 254: 444; 657. 1924.

Mountain. It is not cited from this region in Gray's Manual, but has been recorded recently from Virginia by Friesner.[1]

Solidago monticola T. & G. A small colony of a white-rayed form of this species was found near Thornton Gap, Virginia.

Additional plants deemed worthy of note, collected by the writer in the summers of 1932 and 1933 in the vicinity of the District of Columbia, are as follows:

Solidago canadensis var. Hargeri Fernald. The range of this variety can be extended to Virginia and Maryland. Collections were made near Leesburg, Virginia, and at Widewater, Montgomery County, Maryland. There will undoubtedly be other stations in the future near Washington, D. C.

Ambrosia bidentata Michx. Specimens were collected from a large and flourishing colony of this weed in open woods near Lanham, Prince Georges County, Maryland, where it has apparently been introduced with refuse. Its range, according to Gray's Manual, is "prairies of Illinois to Kansas and southward."

Aegilops ovata L. According to Dr. Hitchcock this grass is a recent introduction on the west coast, and has not previously been reported from elsewhere in the United States. On June 9, 1933, I noticed two plants growing beside an unused cold frame at the governmental farm at Arlington, Virginia. One of these furnished the specimens, and the other unfortunately disappeared shortly after it was discovered.

Specimens of all these plants, except *Solidago canadensis* var. *Hargeri*, have been deposited in the U. S. National Herbarium or in the Gray Herbarium.—Mildred Pladeck, United States Department of Agriculture, Washington, D. C.

Volume 36, no. 430, including pages 353–376 and plates 314–319, was issued 5 October, 1934.

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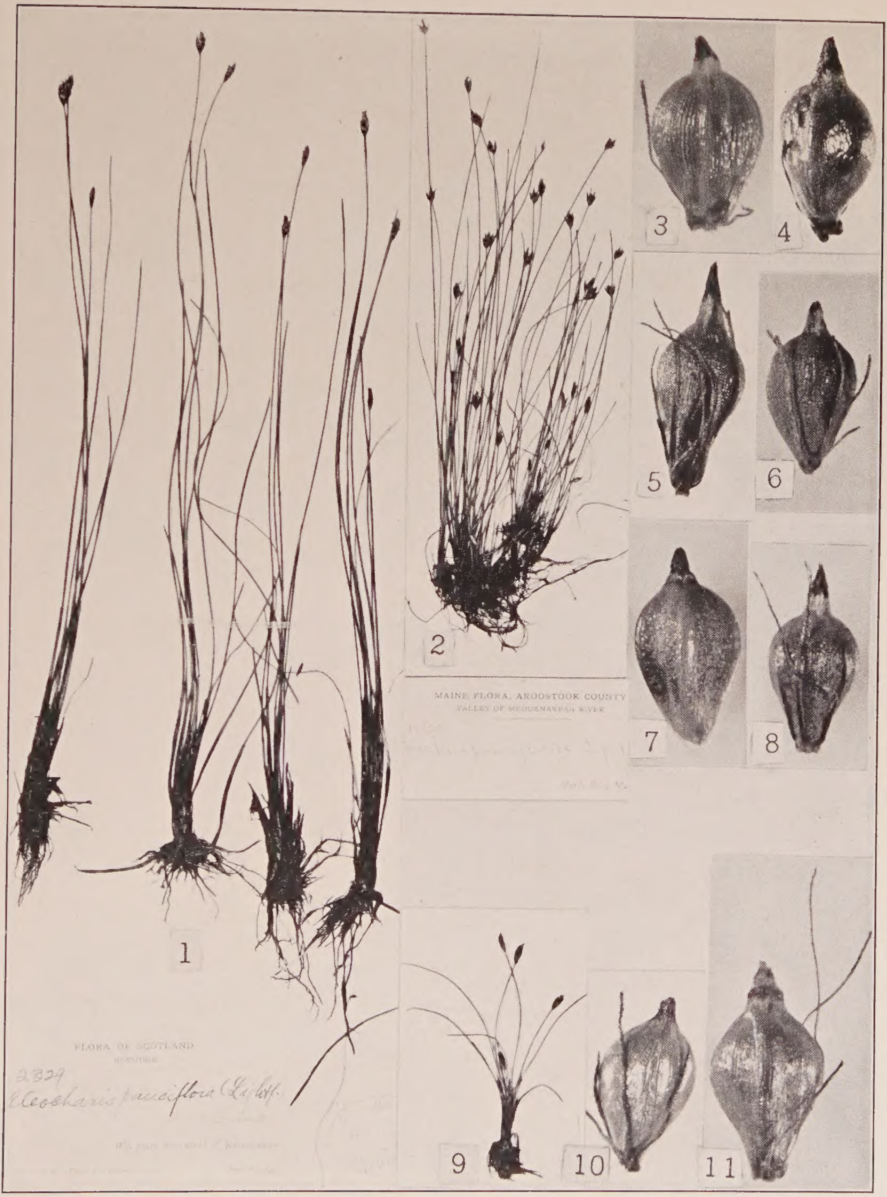
[1] Friesner, Ray C. The Genus Solidago in Northeastern North America. Butler Univ. Bot. Studies 3^1: 46. April, 1933.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MAINE FLORA, AROOSTOOK COUNTY
VALLEY OF MEDUXNAKEAG RIVER
FLORA OF SCOTLAND
2329
Eleocharis pauciflora (Lightf.

ELEOCHARIS PAUCIFLORA: FIGS. 1 and 3, from Scotland; FIGS. 2 and 5, var. FERNALDII from Maine (TYPE); FIG. 4, from Switzerland; FIG. 6, from Tibet; FIGS. 7, 9 and 10, from Chile (E. ATACAMENSIS); FIG. 8, from California (var. BERNARDINA); FIG. 11, from Washington (var. SUKSDORFIANA).

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